Index to Volume 22

How to Use This Index

This index is of similar form to the Cumulative Indexes of this journal, published in November, 1939 and 1949 and is composed of two main divisions: the Author Index and the Subject Index.

The Subject Index to Volume 22 of *The Journal of the Acoustical Society of America* lists the titles of all the papers, abstracts, and patents under twelve section headings as follows: 0, General, unclassified; 1, Acoustical Society of America; 2, Architectural Acoustics; 3, Books and Bibliographies; 4, Ear and Hearing; 5, Applied Acoustics; Instruments and Apparatus; 6, Musical Instruments and Music; 7, Noise; 8, Standards; 9, Speech and Singing; 10, Ultrasonics (Supersonics); 11, Waves and Vibrations; 12, (Changed to Section 0); and 13, Underwater Sound. Each of these sections is further divided into a considerable number of decimally numbered subjects, which are listed below under the heading, "Classification of Subjects." Each subject is divided into four parts entitled Papers, Abstracts, Subtitles, and Patents. Under Papers will be found the original titles of all the papers appearing in the journal on that subject. Under Abstracts are listed the titles of the papers presented at meetings. Since a great amount of valuable material appears in the journal in papers whose titles cannot fully describe all the subjects which the papers cover, some subtitles of papers have been indexed under the heading Subtitles. Also under Subtitles are listed Book Reviews (B.R.) and Letters to the Editor (L.E.). When subtitles covering the material did not appear in the paper, they were written; the captions of some of the figures were also included under the heading. Thus, while the Subtitles portion of the index is informal, it is hoped that it will increase the probability of finding the desired information quickly. All patents appearing in the journal are listed under the heading Patents.

References on most subjects can be located immediately by a logical use of the Classification of Subjects below. In case the reference sought is of an unusual character such that there is uncertainty as to the subject under which it might have been classified, this can usually be found quite quickly by the process of eliminating the sections and subjects under which it is quite improbable that it might have been listed. In case of doubt, a title has often been listed under a number of subjects.

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Classification of Subjects

0. General, Unclassified

1. Acoustical Society of America
- 1.1 General, Unclassified
- 1.2 Constitution and By-Laws
- 1.3 History
- 1.4 Honorary Members
- 1.5 Meetings
- 1.6 Members and Membership Lists
- 1.7 Letters to the Editor

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- 2.3 Studies of Existing Auditoria
- 2.4 Sound Absorption, Theory and Methods of Measurement of (see also 2.5)
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- 2.6 Noise Reduction by Increased Room Absorption
- 2.7 Reverberation and Echoes (see also 2.3, 2.4, 2.8, 2.9, and 2.10)
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- 2.9 Sound Transmission, Theory and Methods of Measurement of (see also 2.10)
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- 4.5 Instruments Relating to Hearing, and for the Testing of Hearing (see also 5.5)
- 4.6 Loudness. Threshold Determinations
- 4.7 Masking (see also 5.5)
- 4.8 Phase Effects (see also 4.3)
- 4.9 Pitch
- 4.10 Subjective Tones
- 4.11 Theories of Hearing
- 4.12 Timbre
- 4.13 Ear Acoustical Impedance

5. Applied Acoustics, Instruments and Apparatus
- 5.1 General, Unclassified
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See also
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11.3 Propagation of Sound. Absorption during Propagation. Velocity of Sound. Refraction. Wave-Length. Doppler Effect (see also 10.4, 10.5, 10.6, 13.2, and 13.3)
11.4 Radiation from Vibrating Objects. Acoustical Impedance. Mechanical Impedance (see also 5.3 and 13.7)
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12. (Changed to Section 0)

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—— **P. E. Doak, and P. J. Westervelt.** Pulse statistics analysis of room acoustics. **22**: 328—1950

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—— **and Rogers H. Galt.** Perception of speech and its relation to telephony. **22**: 89—1950

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—— Transmission of reverberant sound through double walls. **22**: 270—1950
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—— **and Martin L. Touger.** Loudness balance methods for earphone response measurements. **22**: 833—1950
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Relation between past noise environment and hearing loss. J. C. Webster, Harold W. Himes, and Malcolm Lichtenstein. 22: 479—1950

4.5 Instruments Relating to Hearing, and for the Testing of Hearing (see also 5.5)

PAPERS

Calibration of audiometers. E. L. R. Corliss and W. F. Snyder. 22: 837—1950
Electrical and acoustical performance of some commercial audiometers. Keron C. Morrical, Robert W. Benson, and Hallowell Davis. 22: 843—1950

ABSTRACTS

Electrical and acoustical performance of some commercial audiometers. K. C. Morrical, R. W. Benson, and H. Davis. 22: 84—1950
New pure tone group audiometer test. Ralph E. Allison and Alfred L. Larr. 22: 675—1950
Some recent engineering developments in group hearing aids. Charles E. Harrison. 22: 85—1950
Standardizing auditory tests. W. A. Munson and Mark B. Gardner. 22: 675—1950
Strain-gauge type artificial mastoid. R. W. Carlisle and H. A. Pearson. 22: 81—1950

Warble tone audiometer test suitable for group administration over loudspeakers. John C. Webster. 22: 674—1950

SUBTITLE

Historical note on the masking audiometer. B. F. Miessner. 22: 881—1950(L.E.)

PATENTS

Bone conduction hearing aid. Henery Koch. 22: 71—1950

Casing for unitary hearing aids. Don H. Young. 22: 656—1950

Ear insert for earphones. Jasper Baum. 22: 401—1950

Earplug. Lee T. Reynolds. 22: 71—1950

Ear protector with adjustable anchoring means. Maurice C. Rosenblatt. 22: 306—1950

Ear trumpet, including adjustable sections. Severin B. Bankson. 22: 71—1950

Electromagnetic bone vibrator. George Vernier. 22: 306—1950

Flexible acoustic tube. Raoul A. Faralla. 22: 401—1950

Flexible-surfaced bone conduction hearing aid unit. Hugh S. Knowles. 22: 71—1950

Hearing aid chassis. Sam Posen and Harvey E. Hanson. 22: 656—1950

Hearing aid chassis and assembly. Raleigh E. Tresise and Paul D. Kendall. 22: 656—1950

Magnetic insert earphone insertable in the ear of the user. Harry A. Pearson. 22: 655—1950

Microphone mounting for hearing aids. George W. Little. 22: 71—1950

Ornamental cover for hearing aid earphones. May B. Davenport. 22: 71—1950

Receiver cap for hearing aids. Lewis E. Medlin. 22: 401—1950

Soundproof ear appliance. Dallas B. Driskill. 22: 306—1950

Wearable electronic hearing aid having a unitary casing for the batteries and the amplifier. Sam Posen and Harvey E. Hanson. 22: 656—1950

Wearable electronic hearing aid having the amplifier and the batteries contained in a common casing. Sam Posen. 22: 307—1950

Wearable electronic hearing aid having the amplifier and the batteries contained in a common casing. Sam Posen. 22: 655—1950

4.6 Loudness. Threshold Determinations

PAPERS

Individual differences in noise masked thresholds. J. C. Webster, Malcolm Lichtenstein, and Robert S. Gales. 22: 483—1950

Loudness balance methods for earphone response measurements. Daniel W. Martin and Martin L. Touger. 22: 833—1950

Loudness patterns—a new approach. W. A. Munson and Mark B. Gardner. 22: 177—1950

Method of calculating hearing loss for speech from an audiogram. Harvey Fletcher. 22: 1—1950

San Diego County Fair hearing survey. J. C. Webster, Harold W. Himes, and Malcolm Lichtenstein. 22: 473—1950

Sound measurements for psychophysical tests. W. A. Munson and Francis M. Wiener. 22: 382—1950

ABSTRACTS

Calculation and measurement of the loudness of sounds. J. L. Marshall, L. L. Beranek, A. L. Cudworth. 22: 671—1950

Consideration of the intensity-loudness function and its bearing upon the judgment of "tonal range" and "volume level." Stephen E. Stuntz. 22: 674—1950

Free-field thresholds *versus* pressure thresholds at low frequencies. Wayne Rudmose. 22: 82—1950

Sound measurements for psychophysical tests. W. A. Munson and Francis M. Wiener. 22: 82—1950

Supplementary paper No. 2. Individual differences in noise masked thresholds. J. C. Webster, R. S. Gales, and M. Lichtenstein. 22: 83—1950

Threshold and loudness of repeated bursts of noise. Irwin Pollack. 22: 671—1950

4.7 Masking (see also 5.5)

PAPERS

Auditory masking and fatigue. Walter A. Rosenblith. 22: 792—1950

Binaural localization and masking. W. E. Kock. 22: 801—1950

Effect of a thermal masking noise on the pitch of a pure tone. Earl D. Schubert. 22: 497—1950

Individual differences in noise masked thresholds. J. C. Webster, Malcolm Lichtenstein, and Robert S. Gales. 22: 483—1950

Loudness patterns—a new approach. W. A. Munson and Mark B. Gardner. 22: 177—1950

Masking of clicks by pure tones and bands of noise. I. J. Hirsh, W. A. Rosenblith, and W. D. Ward. 22: 631—1950

Masking of pure tones and of speech by white noise. J. E. Hawkins, Jr., and S. S. Stevens. 22: 6—1950

On the masking pattern of a simple auditory stimulus. James P. Egan and Harold W. Hake. 22: 622—1950

Effect of exposure to loud sounds upon the response to clicks. Walter A. Rosenblith and Robert Galambos. 22: 84—1950

Masking of a pure tone at a gap in a thermal noise spectrum. T. H. Schafer, P. O. Thompson, and J. C. Webster. 22: 671—1950

Masking of tones by narrow bands of noise. C. A. Shewmaker, T. H. Schafer, and R. S. Gales. 22: 84—1950

Recovery of auditory nerve action potentials after masking, J. E. Hawkins, Jr., and M. Kniazuk. 22: 84—1950

Speech interference levels as criteria for rating background noise in offices. L. L. Beranek and R. B. Newman. 22: 671—1950

SUBTITLE

Masking of one speech sound by another. Harvey Fletcher and Rogers H. Galt. 22: 112—1950

4.8 Phase Effects (see also 4.3)

PAPER

Discriminability of interaural phase relations in two-component tones. J. C. R. Licklider and J. C. Webster. 22: 191—1950

4.9 Pitch

PAPERS

Changes in pitch of tones of low frequency as a function of the pattern of excitation produced by a band of noise. James P. Egan and Donald R. Mayer. 22: 827—1950

Effect of a thermal masking noise on the pitch of a pure tone. Earl D. Schubert. 22: 497—1950

Frequency selectivity of the ear as determined by masking experiments. T. H. Schafer, R. S. Gales, C. A. Shewmaker, and P. O. Thompson. 22: 490—1950

Trill threshold. George A. Miller and George A. Heise. 22: 637—1950

ABSTRACTS

Effect of thermal masking noise on the pitch of a pure tone. Earl D. Schubert. 22: 82—1950

On the mechanism of auditory frequency selectivity. J. C. R. Licklider. 22: 83—1950

Perceptibility of frequency modulation ("flutter") in pure tones. Harry Schecter. 22: 82—1950

SUBTITLES
Change in pitch of sustained musical note by clenching of the jaws of the observer. Victor B. Corey. 22: 640—1950(L.E.)
Rise in pitch of pure tone on introduction of thermal noise. N. A. Watson and T. V. Frazier. 22: 62—1950 (L.E.)

4.10 Subjective Tones

ABSTRACT
Subharmonics generated in human and animal ears by intense sound. H. E. von Gierke. 22: 675—1950

4.11 Theories of Hearing

PAPERS
Dynamical theory of the cochlea. L. C. Peterson and B. P. Bogert. 22: 369—1950
Neurophysiology of the auditory system. Robert Galambos. 22: 785—1950
Theory of operation of the cochlea: a contribution to the hydrodynamics of the cochlea. O. F. Ranke. 22: 772—1950
Theory of the acoustical action of the cochlea. J. Zwislocki. 22: 778—1950

ABSTRACTS
Dynamical theory of the cochlea. L. C. Peterson and B. P. Bogert. 22: 84—1950
Test of the frequency theory of hearing. H. Davis, S. R. Silverman, and D. R. McAuliffe. 22: 674—1950

SUBTITLES
Equivalent circuit of cochlea. L. C. Peterson and B. P. Bogert. 22: 381—1950
Erratum: A dynamical theory of the cochlea. L. C. Peterson and B. P. Bogert. 22: 640—1950

5. Applied Acoustics, Instruments and Apparatus

5.1 General, Unclassified

ABSTRACT
Ferroelectric phenomena—a review. W. P. Mason. 22: 676—1950

PATENTS
Acoustic switch. A. Reyner Eastman. 22: 72—1950
Engine noise equipment. Claude K. Wilkinson. 22: 71—1950
Frequency controlled ammeter. Frank Rieber. 22: 72—1950
Periodic signaling apparatus. Carl C. Chambers and Ralph M. Showers. 22: 656—1950
Siren. John Floyd Fletcher. 22: 656—1950
Siren. Albert L. Guthner. 22: 71—1950
Sonic method for control of air in ice cream. Raymond Friedman. 22: 896—1950
Sound regulator for telephone ringers. William E. Whidden. 22: 529—1950

5.2 Amplifiers and Attenuators

SUBTITLE
Overloading. Harvey Fletcher and Rogers H. Galt. 22: 126—1950

5.3 Acoustical and Mechanical Impedance Measurement (see also 11.4)

PAPER
Method for measuring source impedance and tube attenuation. J. E. White. 22: 565—1950

ABSTRACT
Null-balance apparatus for measuring acoustic impedance. J. R. Cox, W. M. Ihde, and A. P. G. Peterson. 22: 679—1950

5.4 Analyzers and Filters, Mechanical and Electrical. Acoustic Filters. Oscillographs (see also 5.15)

PAPERS
Acoustic filter for water-filled pipes. Robert M. Hoover, Donald T. Laird, and Laymon N. Miller. 22: 38—1950
Continuously variable filter. C. Gunnar M. Fant. 22: 449—1950
Tuning fork filter. Karl N. Wulfsberg. 22: 847—1950

ABSTRACTS
Continuously variable filter for acoustic applications. Gunnar Fant. 22: 80—1950
New techniques in the analysis of motor and machine noise. R. O. Fehr and G. E. Henry. 22: 671—1950

SUBTITLE
Response of a tuned circuit to a band of noise. T. H. Schafer, R. S. Gales, C. A. Shewmaker, and P. O. Thompson. 22: 492—1950

PATENTS
Magnetostrictively driven mechanical wave filter. Robert Adler. 22: 896—1950
Piezoelectric crystal apparatus. Warren P. Mason. 22: 307—1950
Piezoelectric crystal apparatus. Warren P. Mason. 22: 529—1950
Wave analysis. Ralph K. Potter. 22: 307—1950
Wave analyzer. George W. Cook. 22: 401—1950

5.5 Audiometers (see also 4.4 and 4.5)

PAPERS
Calibration of audiometers. E. L. R. Corliss and W. F. Snyder. 22: 837—1950
Electrical and acoustical performance of some commercial audiometers. Keron C. Morrical, Robert W. Benson, and Hallowell Davis. 22: 843—1950
Audiometer. Lourens Blok. 22: 308—1950
Audiometer for air and bone conducting receivers having a scale with a single zero hearing loss reference. Ralph E. Allison. 22: 307—1950

5.8 Loudspeakers, Horns (see also 5.13 and 5.17)

PAPERS
Acoustical impedance of closed rectangular loudspeaker housings. Willard F. Meeker, Frank H. Slaymaker, and Lynn L. Merrill. 22: 206—1950
Electroacoustic phase shift in loudspeakers. Charles A. Ewaskio and Osman K. Mawardi. 22: 444—1950
Evaluation of the magnetostrictive properties of Hiperco. H. Sussman and S. L. Ehrlich. 22: 499—1950
Piezoelectric equations of state and their application to thickness-vibration transducers. Walter G. Cady. 22: 579—1950
Resonance characteristics of a finite catenoidal horn. G. J. Thiessen. 22: 558—1950
Response peaks in finite horns. C. T. Molloy. 22: 551—1950

ABSTRACTS
Electrostatic loudspeakers. Arthur A. Janszen. 22: 85—1950
High efficiency loudspeakers for personal radio receivers. H. F. Olson, J. C. Bleazey, J. Preston, and R. A. Hackley. 22: 673—1950
Loudspeaker problem. Osman K. Mawardi. 22: 85—1950
Transient testing of loudspeakers. Osman K. Mawardi. 22: 673—1950

PATENTS
Cellular support for loudspeakers, including acoustic chambers. Gabriel M. Giannini. 22: 656—1950
Combined moving coil loudspeaker and transformer. John J. Root. 22: 657—1950
Double diaphragm loudspeaker. John Firth Marquis. 22: 898—1950
Eddy current loudspeaker. Joseph W. Suydam. 22: 897—1950
Electropneumatic loudspeaker. Joseph L. Fodor. 22: 896—1950
Loudspeaker cabinet with plural partitions forming labyrinth. James J. Wenzel. 22: 657—1950

Loudspeaker diaphragm support comprising plural compliant members. Harry F. Olson and John Preston. 22: 897—1950
Loudspeaker diaphragm support member. Hugh S. Knowles. 22: 402—1950
Loudspeaker with diaphragm an integral part of outer casing. Frank Massa. 22: 898—1950
Magnetic assembly for permanent magnet-type loudspeakers. Francis H. Goldsmith. 22: 896—1950
Magnetic field structure for dynamic loudspeakers and the like. David H. Cunningham. 22: 898—1950
Permanent magnet assembly for electrodynamic loudspeakers. Fred J. Harbaugh. 22: 898—1950
Piezoelectric transducer. Kenneth W. McLoad. 22: 898—1950
Re-entrant horn assembly. Sidney E. Levy. 22: 897—1950
Reflex-type loudspeaker cabinet. Stanley M. Kincart. 22: 897—1950
Sealed-coil-type vibratory magnet loudspeaker. John O. Angehrn. 22: 897—1950
Support clamp for electrodynamic loudspeakers. James P. Quam. 22: 402—1950

5.9 Microphones. Vibration Microphones. Microphone Calibration Equipment and Techniques (see also 13.11t)

PAPERS

Accelerometer calibration technique. F. G. Tyzzer and H. C. Hardy. 22: 454—1950
Design and characteristics of a high sensitivity direct current operated accelerometer. Robert C. Lewis. 22: 357—1950
Evaluation of the magnetostrictive properties of Hiperco. H. Sussman and S. L. Ehrlich. 22: 499—1950
Reciprocity pressure response formula which includes the effect of the chamber load on the motion of the transducer diaphragms. M. S. Hawley. 22: 56—1950
Second-order gradient noise-canceling microphone using a single diaphragm. W. A. Beaverson and A. M. Wiggins. 22: 592—1950

ABSTRACTS

Accelerometer calibration technique. F. G. Tyzzer and H. C. Hardy. 22: 81—1950
Design and characteristics of a high sensitivity direct current operated accelerometer. R. C. Lewis. 22: 81—1950
Experimental results of the cavity reciprocity calibration of dissimilar pressure microphones. R. W. Benson and K. C. Morrical. 22: 86—1950
Extremely small meter for the measurement of absolute pressures. Wolf W. von Wittern. 22: 672—1950
Ferroelectric phenomena—a review. W. P. Mason. 22: 676—1950
Reactance tube circuit applicable to microphone calibration. W. W. von Wittern and H. E. von Gierke. 22: 85—1950
Reciprocity calibrations in closed couplers. Bernard D. Simmons. 22: 86—1950
Reciprocity calibration of microphones using a pulse technique. R. L. Terry and R. B. Watson. 22: 672—1950
Second-order gradient noise-canceling microphone using a single diaphragm. A. M. Wiggins and Wayne N. Beaverson. 22: 672—1950
Small high frequency barium titanate microphone. Clayton H. Allen. 22: 85—1950

SUBTITLES

Carbon microphone distortion. Harvey Fletcher and Rogers H. Galt. 22: 126—1950
Three-transducer reciprocity formula for vibration pick-ups. Stanley Greenblatt. 22: 881—1950(L.E.)

PATENTS

Carbon-type microphone. Charles Laurent. 22: 657—1950
Condenser transducer independent of ambient atmospheric conditions. Wilden A. Munson and Edward C. Wente. 22: 900—1950
Damping for dynamic loudspeakers. Ellsworth D. Cook. 22: 899—1950
Dipole microphone. Benjamine Olney, Frank H. Slaymaker, and Willard F. Meeker. 22: 898—1950
Electroacoustical transducer. Gabriel M. Giannini. 22: 72—1950
Electrodynamic loudspeaker. Leonard Walter Murkham. 22: 900—1950
Electromechanical transducer. John P. Arndt, Jr. 22: 899—1950
Electrostrictive translator. George A. Argabrite. 22: 657—1950
Electrotransducer and method of making same. Charles K. Gravely. 22: 657—1950
Hand microphone and switch. Webster E. Gilman and Raymond C. Bierman. 22: 898—1950
Magnetic equalization of sensitivity in ribbon microphone assemblies. Leslie J. Anderson. 22: 657—1950
Microphone with fuse. Olof D. M. Guthe and Oscar A. Shann. 22: 900—1950
Moving coil transducer and enclosure. Claude Langdon Richards. 22: 900—1950
Pick-up for use in acceleration indicating, measuring, and recording apparatus. P. C. Efromson and R. C. Lewis. 22: 900—1950
Piezoelectric means for converting pressure variations into potential variations. Walter Kistler. 22: 901—1950
Piezoelectric sound pressure microphone. Frank Massa. 22: 402—1950
Piezoelectric transducer and method for producing the same. Charles K. Gravely. 22: 899—1950
Stabilized feed-back condenser microphone. William R. Harry. 22: 900—1950
Structure for magnetostriction transducers. Clare H. Kean. 22: 529—1950
Temperature compensated vibration pick-up. Frank Slason. 22: 308—1950
Testing system and method. Edward E. Mott. 22: 72—1950
Torsional vibration pick-up. Samuel Stein. 22: 308—1950
Transducer means. Frank Massa. 22: 402—1950
Transistor-microphone. Robert L. Hanson. 22: 900—1950

5.10 Navigational Instruments Using Air Sound. Altitude Measuring Instruments. Sound Ranging (for Underwater Ranging see 13.11n). Geophysical Prospecting

PATENTS

Dual microphone sound detector system. Leslie J. Anderson and Alfred H. Kettler. 22: 658—1950
Geophone. Raymond G. Piety. 22: 402—1950
Method and apparatus for analyzing seismographic records. James E. Hawkins. 22: 308—1950
Method and apparatus for detecting waves. Alexander McLean Nicolson. 22: 658—1950
Ranging system. Frank H. Slaymaker and Willard F. Meeker. 22: 657—1950
Reproducing and translating apparatus. Robert W. Baltosser. 22: 529—1950
Seismic surveying. Paul J. Rudolph. 22: 72—1950
Testing device for seismic signal apparatus. James E. Hawkins. 22: 530—1950

5.11 Oscillators, Electrical and Mechanical

PATENT

Torsional vibration exhibiting means. T. C. Van Degrift. **22**: 403—1950

5.13 Public Address Systems and Sound Picture Installations

SUBTITLE

Sound system for translations of the opera. B. F. Miessner. **22**: 513—1950(L.E.)

PATENTS

Method and apparatus for noise control of reproduced sound. Harry F. Olson and John Preston. **22**: 73—1950

Sound system which compensates for variable noise levels. Frank A. Morris. **22**: 73—1950

5.15 Sound Level Meters. Level Recorders. Sound Pressure Measurement (see also 5.4)

ABSTRACT

Automatic sound-field mapper. Jordan J. Baruch. **22**: 686—1950

PATENT

Device for indicating the sum of the intensity and duration of sound. Rudolph W. Stanmyre. **22**: 658—1950

5.16 Sound Recording and Reproducing. General

PAPER

An apparatus for speech compression and expansion and for replaying visible speech records. F. Vilbig. **22**: 754—1950

PATENT

Recording and transcribing mechanism. David S. Swarthout and John W. Atkinson. **22**: 403—1950

5.16d Disk Recording (including cutting and embossing)

PAPER

Comments on the paper "Universal phonograph styli." Howard A. Chinn. **22**: 515—1950(L.E.)

ABSTRACTS

Devices for eliminating WOW in the reproduction of commercial disk records. R. Clark Jones. **22**: 687—1950

Some applications of square-wave testing techniques to the evaluation of disk recording systems. Samuel R. Bradshaw and Weiant Wathen-Dunn. **22**: 673—1950

Stylus-groove relations in the phonograph playback processes. Frank G. Miller. **22**: 673—1950

PATENTS

Apparatus for uninterrupted reproduction of disk phonograph records. Robert E. Stanton. **22**: 74—1950

Capacity-type pick-up. Chester M. Sinnett. **22**: 309—1950

Combined filter network and electromechanical transducer. Gerrit Schenkel. **22**: 902—1950

Dual purpose transducer with recording damping means. William K. Rieber. **22**: 659—1950

Electrodynamic phonograph pick-up. Ronald J. Rockwell. **22**: 901—1950

Electromagnetic pick-up. Harvey F. Schwarz. **22**: 310—1950

Magnetic sound translating head. Lionel B. Cornwell. **22**: 73—1950

Magnetron-type phonograph pick-up. Hans Kohn Richards. **22**: 531—1950

Means for mounting the armature of a magnetic phonograph record reproducer and recording head. Ralph William Nicholls. **22**: 310—1950

Pick-up with two needles. Edward F. Andrews. **22**: 902—1950

Phonograph needle. William H. Hutter. **22**: 530—1950

Phonograph needle sharpener. Peter J. Gaylor. **22**: 309—1950

Phonograph pick-up. Roy Dally. **22**: 902—1950

Phonograph pick-up device. Elmer O. Thompson. **22**: 902—1950

Phonograph pick-up having plastic torsion arm. William H. Hutter. **22**: 658—1950

Phonograph pick-up unit using magnetostrictive wire. Stanley R. Rich. **22**: 530—1950

Phonograph pick-up with mechanical filter. Henry P. Kalmus. **22**: 531—1950

Phonograph record. James H. Hunter. **22**: 73—1950

Phonographic apparatus. William K. Rieber. **22**: 901—1950

Phonographic device. Hubert L. Shortt. **22**: 73—1950

Phonographic transducer. William K. Rieber. **22**: 658—1950

Phonographic transducer device. George C. Tibbetts. **22**: 531—1950

Recording disk for sound and pictures. Adolph F. von Soden. **22**: 73—1950

Repeat device for automatic phonographs. Sven A. Stolberg. **22**: 531—1950

Resistance apparatus for converting mechanical movements into electrical pulses. Leo L. Helterline, Jr. **22**: 530—1950

Reverse re-recording system. Lincoln Thompson. **22**: 309—1950

Signal recording apparatus. Henry E. Roys. **22**: 658—1950

Sound recorder. George P. Brubaker. **22**: 308—1950

Sound recorder. Sumter Calvert. **22**: 73—1950

Sound recorder and reproducer. Judson O'D. Shepherd. **22**: 658—1950

Sound recording method and apparatus. Homer R. Montague. **22**: 659—1950

Sound translating device. Richard G. Leitner. **22**: 901—1950

Spiral sound record strip. Richard G. Leitner. **22**: 901—1950

Stylus construction. Benjamin B. Bauer. **22**: 73—1950

Tone arm and pick-up assembly. Clarence F. Jensen. **22**: 658—1950

Universal reproducer head mounting. Lincoln Thompson. **22**: 309—1950

Variable inductance frequency-modulation phonograph system. Robert Boudreaux. **22**: 309—1950

Variable inductance signal translating device. Henry S. Huff. **22**: 531—1950

Variable resistance phonograph pick-up. Robert B. Albright. **22**: 530—1950

Variable resistance phonograph pick-up and system. Walter L. Eckhardt and Madison Cawein. **22**: 659—1950

5.16f Film Recording (by photographic means)

PATENTS

Method and apparatus for controlling frequency characteristics in sound recording. Michael Rettinger and Kurt Singer. **22**: 74—1950

Monitoring system for sound recording. Lawrence T. Sachtleben. **22**: 903—1950

Photographic sound recording head. Antoine Heurtier. **22**: 903—1950

Photographic sound recording system and aperture plate therefor. Glenn L. Dimmick. **22**: 902—1950

Photographic sound recording system and monitoring arrangement therefor. Glenn L. Dimmick. **22**: 902—1950

Reproduction of sound. Harold E. Haynes. **22**: 74—1950

Sound recording system and aperture. Alfred R. Ulmer. **22**: 903—1950

Sound-reproducing device. John R. Cooney. 22: 532—1950

5.16m Magnetic Recording

PATENTS

Art of recording and reproducing two-sided magnetic records. DeWitt R. Goddard. 22: 660—1950

Bifilar magnetic recording system. Marvin Camras. 22: 311—1950

Combined recorder and reproducer. Serge Alexander Scherbatskoy. 22: 74—1950

Combined recording and reproducing. Serge A. Scherbatskoy. 22: 403—1950

Constant speed drive for magnetic recorders. Marvin Camras. 22: 659—1950

Device to prevent accidental erasure of magnetic records. Semi Joseph Begun and John P. Arndt, Jr. 22: 904—1950

Drive system for magnetic recorders. Willard H. Wade. 22: 403—1950

Hum bucking arrangement for magnetic transducers. Charles W. Clapp. 22: 311—1950

Indexing and speed control system for magnetic reproducers. Jacob Neufeld. 22: 660—1950

Level wind mechanism for magnetic recorders. George O. Harm. 22: 404—1950

Magazine for magnetic recording and reproducing device. Marvin Camras. 22: 312—1950

Magazine-type magnetic recorder. Herman Nygaard. 22: 660—1950

Magazine-type magnetic recording apparatus. Walter J. Haloski. 22: 74—1950

Magazine-type magnetic recording apparatus. Earle L. Kent. 22: 310—1950

Magnetic disk record. Montford Morrison. 22: 904—1950

Magnetic-photographic re-recording system. Dorothy L. O'Dea. 22: 659—1950

Magnetic record reproducing system. Dorothy L. O'Dea. 22: 904—1950

Magnetic recorder for producing multiple duplicate records. Russell J. Tinkham. 22: 662—1950

Magnetic recorder head. Marvin Camras. 22: 310—1950

Magnetic recorder method and means. Hugh A. Howell. 22: 312—1950

Magnetic recorder unit. William P. Lear. 22: 659—1950

Magnetic recording and reproducing apparatus. Russell J. Tinkham and Robert L. Landon. 22: 904—1950

Magnetic recording and reproducing apparatus using an endless spirally wound magnetic tape. Semi Joseph Begun. 22: 660—1950

Magnetic recording apparatus. Marvin Camras. 22: 660—1950

Magnetic recording apparatus. Leland B. Greenleaf. 22: 403—1950

Magnetic recording apparatus. Arthur W. Sear. 22: 904—1950

Magnetic recording apparatus. Joseph B. Walker. 22: 662—1950

Magnetic recording head. Marvin Camras. 22: 311—1950

Magnetic recording medium. Hugh A. Howell. 22: 662—1950

Magnetic sound recorder utilizing varying cathode currents. Shirley Irving Weiss. 22: 312—1950

Magnetic sound recording and reproducing apparatus. Terry M. Shrader. 22: 662—1950

Magnetic sound recording apparatus. Joseph B. Walker. 22: 661—1950

Magnetic transducer with wear-resistant guide surfaces. Ernst Keller and Franz Roggen. 22: 312—1950

Magnetic transducing core for magnetic record transducers. Semi Joseph Begun and Marvin D. Temple. 22: 660—1950

Magnetic wire sound recording and reproducing apparatus. Donald B. McLouth. 22: 662—1950

Magnetic wire sound recording and reproducing apparatus. Mortimer A. Neff. 22: 662—1950

Magnetizable wire recording system and method. Stanley D. Eilenberger. 22: 404—1950

Means for bulk demagnetization. Marvin Camras. 22: 311—1950

Means for demagnetizing high coercive force materials. Hugh A. Howell. 22: 661—1950

Method and apparatus for producing a helical magnetic sound track on a wire record. Howard E. Tompkins and William E. Bradley. 22: 905—1950

Non-twisting paramagnetic record wire. Marvin Camras. 22: 310—1950

Recording process utilizing the magnetic field of a current conducted by the record member. William A. Brastad and Lester F. Borchardt. 22: 311—1950

Recording sound on wire. William A. Brastad and Lester F. Borchardt. 22: 905—1950

Reeling device for wire records. Walter Howey. 22: 904—1950

Selector system for magnetic wire reproducers. Marion S. Danisch. 22: 311—1950

Sensing system for magnetically recorded signals. Raymond E. Cheney, John L. Wagner, and Robert E. Lawhead. 22: 661—1950

Sound reproducing apparatus. Secundino Rey. 22: 904—1950

System for magnetically recording a modulated carrier in push-pull. Semi Joseph Begun. 22: 661—1950

Transducing system to compensate for torsion in a magnetic record wire. Jacob Neufeld. 22: 74—1950

Wire and tape driving means. Russell J. Tinkham. 22: 661—1950

Wire recorder. C. B. Dale. 22: 311—1950

Wire recording system. Edward S. Peterson. 22: 310—1950

5.17 Telephone. Telephone Receivers

PAPERS

American standard method for the coupler calibration of earphones Z24.9—1949 (abridged). L. L. Beranek, F. F. Romanow, K. C. Morrical, L. J. Anderson, B. B. Bauer, R. D. Cook, and W. Wathen-Dunn. 22: 602—1950

American standard method for the pressure calibration of laboratory standard microphones Z24.4—1949 (abridged). L. L. Beranek, R. K. Cook, F. F. Romanow, F. M. Wiener, and B. B. Bauer. 22: 611—1950

American standard specification for laboratory standard pressure microphones Z24.8—1949 (abridged). L. L. Beranek, F. M. Wiener, F. Massa, B. B. Bauer, F. F. Romanow, and R. K. Cook. 22: 609—1950

Loudness balance methods for earphone response measurements. Daniel W. Martin and Martin L. Touger. 22: 833—1950

Perception of speech and its relation to telephony. Harvey Fletcher and Rogers H. Galt. 22: 89—1950

ABSTRACT

Loudness balance methods for earphone response measurement. Daniel W. Martin and Martin L. Touger. 22: 82—1950

SUBTITLES

Carbon microphone distortion. Harvey Fletcher and Rogers H. Galt. 22: 126—1950

Errata: The perception of speech and its relation to telephony. Harvey Fletcher and Rogers H. Galt. **22**: 327—1950
Some effects of side-tone delay. Bernard S. Lee. **22**: 639—1950(L.E.)

PATENTS

Adjustable earphone. Ross E. Dulinsky. **22**: 404—1950
Earphone socket. Adolph Martin Mondl. **22**: 312—1950
Earphone socket and noise shield. John Volkmann. **22**: 312—1950
Electrodynamic telephone handset. Carl Beckman and Irving Zambakian. **22**: 663—1950
Electromagnetic earphone receiver. William F. Knauert. **22**: 74—1950
Electromagnetic sound-powered telephone. Glen L. Dimmick. **22**: 404—1950
Handset support and inductive pick-up for telephone signal amplifying system. Matthys L. M. Souget. **22**: 905—1950
Loud-speaking telephone set with low acoustic coupling. Edward S. Peterson. **22**: 663—1950
Microphone holder. Roy L. Huff. **22**: 312—1950
Noise shield for handsets. Paul S. Veneklasen. **22**: 312—1950
Sound transmission ear vestibule for telephone conversation recording. Scott B. Berkeley. **22**: 663—1950
Telephone mouthpiece voice silencer with plural silencer chambers. Louis S. Scher. **22**: 662—1950

5.19 Tuning Forks

PAPER

Tuning fork filter. Karl N. Wulfsberg. **22**: 847—1950

PATENT

Tuning fork and control system. Austin G. Cooley. **22**: 663—1950

5.21 Vibration Devices. Devices for Generating or Damping Vibrations (see also 2.11 and 5.9), see also 2.8, 4.5, 9.6, 10.3, 13.11, 13.11n, and 13.11t

ABSTRACT

Design and characteristics of a high sensitivity direct current operated accelerometer. R. C. Lewis. **22**: 81—1950

SUBTITLE

Three-transducer reciprocity formula for vibration pickups. Stanley Greenblatt. **22**: 881—1950(L.E.)

PATENTS

Handset provided with a sound collecting lid movably mounted before the microphone. Hans Yngve Kraepelien. **22**: 906—1950
Means for damping torsional vibrations in internal-combustion engines. Thomas H. Peirce. **22**: 905—1950
Peak accelerometer. William H. Hoppmann. **22**: 905—1950
Resilient wheel. Tim Zintsmaster. **22**: 905—1950
Vibration damper. J. A. Hardy. **22**: 404—1950
Vibration damper for overhead cables. Louis Rostoker. **22**: 906—1950
Vibration spectrometer. Rudolph M. Langer. **22**: 906—1950
Vibration testing apparatus. Benjamin J. Lazan. **22**: 906—1950

6. Musical Instruments and Music

6.1 General, Unclassified

ABSTRACT

Impact of acoustics on music. Robert H. Tanner. **22**: 681—1950

PATENTS

Chord indicator. Louis Ruben and E. Jack Zeik. **22**: 312—1950
Music producing unit. Nathan Paul Blair. **22**: 906—1950
Music timing apparatus. Raymond D. Bergey. **22**: 663—1950
Musical instrument. Richard T. Cornelius. **22**: 664—1950
Musical whistle. Virgil R. Kimple. **22**: 532—1950
Ocarina. William W. Gretsch. **22**: 74—1950
Sound improving device. Parrielee D. Jackson. **22**: 906—1950

6.2 Bells, Xylophones. Other Instruments Having Rigid Vibrators

SUBTITLE

Changes in pitch of bells. Jan Arts. **22**: 511—1950(L.E.)

PATENTS

Damper operating mechanism for electric percussion instruments. Paul H. Rowe. **22**: 664—1950
Instrument mallet. Bruce W. Dane. **22**: 664—1950
Melody comb. Theodore R. Duncan. **22**: 907—1950
Music box. Norman T. Boyle. **22**: 906—1950
Musical instrument. John A. Brewer. **22**: 532—1950
Piano. Harold Burroughs Rhodes. **22**: 405—1950

6.3 Brass Wind Instruments (lip vibrated)

PATENTS

Acoustic attenuator. J. Guy Woodward. **22**: 312—1950
Drainage valve for musical instruments. Peter J. De Rubeis. **22**: 532—1950
French horn. Claude E. Hubley. **22**: 664—1950

6.4 Drums and Other Membranophonic Instruments

PATENT

Combination drumstick and maraca. Harry Mossey. **22**: 532—1950

6.5 Pipe Organs

PATENT

Keyboard cover. Paul M. Fuller. **22**: 532—1950

6.6 Pianos and Other Keyboard Stringed Instruments

PATENTS

Adjustable balance rail for keyboards. Harold G. Pond. **22**: 313—1950
Automatic player mechanism for musical instruments. Peter T. Calamari and Paul F. Murdock. **22**: 907—1950
Casing for upright pianos. William Zaiser. **22**: 907—1950
Mouthpiece attachment for playing keyboard musical instruments. Paul V. Elfstrom. **22**: 907—1950
Musical instrument. James E. Bradley. **22**: 664—1950
Pedal extension and footrest attachment for pianos. George L. Hobbs. **22**: 313—1950
Photoelectric musical instrument. Edward M. Jones. **22**: 532—1950
Piano. Webster E. Janssen. **22**: 907—1950
Piano. Sidney C. Shill. **22**: 406—1950
Piano action. Benjamin F. Miessner. **22**: 405—1950
Piano action. Wallace H. Schultz. **22**: 406—1950
Piano action. Charles F. Smith. **22**: 313—1950
Piano action. Charles Frederick Stein. **22**: 405—1950
Piano casing. William Zaiser. **22**: 313—1950
Piano construction. Francis C. Socin. **22**: 907—1950
Piano construction. Ralph W. E. Sperry and Jack C. Horth. **22**: 907—1950
Piano construction. George H. Stapely. **22**: 532—1950
Piano key action. David Barnett. **22**: 532—1950
Piano key mounting. Harry A. Felder. **22**: 533—1950
Piano key mounting. Edward C. Sloan. **22**: 406—1950
Piano keyboard and soft pedal action. Alfred H. Howe. **22**: 664—1950
Piano pedal extension device. Jean Oskar Rydstrom. **22**: 313—1950
Piano sound board. Joseph Sauerland. **22**: 405—1950
Resonating chamber construction for pianos. Herbert O. Crippen, Sr. **22**: 664—1950

Transposing keyboard. William H. Watkins. 22: 665—1950
Tuning device for pianofortes. John Meizner. 22: 406—1950
Vertical piano action. Victor M. Montoya. 22: 405—1950

6.7 Violin Family. Stringed Instruments except Keyboard Type

PATENTS

Acoustic skeleton chamber for string instruments. Giuseppe Virzi. 22: 409—1950
Attachment for stringed musical instruments. Walter E. Smith. 22: 408—1950
Banjo head tightener. Edward J. Handloser. 22: 76—1950
Bar for stringed instruments. Ray P. Engles. 22: 533—1950
Bow for a stringed musical instrument. John A. Graydon. 22: 75—1950
Bow for musical instruments. Alfred Nathan. 22: 314—1950
Bow for violins and other stringed instruments. Percy Gordon Attwood. 22: 75—1950
Bridge for fretted stringed musical instruments. Emery R. Widowson. 22: 533—1950
Bridge for stringed instruments. Per Gustav Folke Lundbäck. 22: 533—1950
Chin rest for violins. William Halko. 22: 407—1950
Collapsible bass fiddle. Peter Ruggiero. 22: 75—1950
Combination electrical pick-up and bridge for guitars and other instruments. William Ernest Harker. 22: 407—1950
Finger board for stringed musical instruments. Allan B. Frost. 22: 409—1950
Guitar. Jack D. Suite. 22: 408—1950
Guitar. Hugo Willner. 22: 314—1950
Guitar bar or steel having a rotating contact face. Fremont W. Peasley. 22: 407—1950
Guitar body construction. Thomas W. Mitchell. 22: 665—1950
Guitar steel. Francis William Wright. 22: 75—1950
Guitar steel. Abe M. Zipperstein and Benjamin Vitto. 22: 665—1950
Hand position guide for bowed-string instruments. Clarence F. Dissinger. 22: 314—1950
Hawaiian electric guitar with harmonic facilities. Jack W. Gillenwater. 22: 666—1950
Mouth organ. Hans Bibus. 22: 314—1950
Musical instrument. George Barr. 22: 75—1950
Musical instrument. Harry Lewis. 22: 407—1950
Musical instrument. William W. Nelson. 22: 75—1950
Musical instrument and support therefor. William Karl Krause. 22: 314—1950
Musical instrument bow. Edwin B. Tichenor. 22: 314—1950
Musical instrument of the string type. Clyde B. Page. 22: 313—1950
Musical instruments with tensioned strings. John W. McBride. 22: 408—1950
Musical stringed instrument. Emerson Strong. 22: 75—1950
Mute for musical instruments. Thomas L. Fawick. 22: 406—1950
Mute for string instruments. Stanley Ohab. 22: 534—1950
Pitch changing device for musical instruments. Walter E. Smith. 22: 408—1950
Plastic violin bow. Paul E. Hohl. 22: 408—1950
Plectrum or pick for musical instruments. Hyman Galetzky. 22: 407—1950
Plectrum with two playing points. Raymond H. Lawrence. 22: 315—1950
Practice mute for string instruments. Karl Schuh. 22: 314—1950
Shoulder rest for musical instruments. George N. Humphrey. 22: 406—1950
Stringed musical instrument. Frederic E. Conkling and Opal H. Conkling. 22: 533—1950
Stringed musical instrument. Louis Dopyera. 22: 665—1950
Stringed musical instrument. Herbert Hise and John B. Cousineau. 22: 75—1950
Stringed musical instrument. John W. McBride. 22: 314—1950
Stringed musical instrument. John W. McBride. 22: 665—1950
Stringed musical instrument. Elmer F. Stromberg. 22: 314—1950
Stringed musical instrument. Roy M. Sullivan. 22: 908—1950
Stringed musical instrument and bow. John A. Graydon. 22: 533—1950
Support for violon-cellos. Josef Schroetter. 22: 665—1950
Tailpiece for violins, etc. Warren B. Straton. 22: 315—1950
Tone bar for guitars and the like. Henry J. Garcia. 22: 533—1950
Variable tone control device. Albert Claus Fitschen. 22: 315—1950
Vibratory bridge for stringed musical instruments. Roy W. Watts. 22: 75—1950
Violin. Ignatz Kohn. 22: 907—1950
Violin. Louie H. Lower. 22: 407—1950
Violin bow. Luther S. Brown. 22: 406—1950
Violin bow construction. Warren B. Straton. 22: 533—1950
Violin microphone. Harry De Armond. 22: 407—1950
Violin rest. Stanley T. Mills. 22: 408—1950
Violin ring mute. Ingram Cleveland. 22: 406—1950
Violin shoulder rest. Barney R. Nyhagen. 22: 408—1950
Violin shoulder safety pad. Joseph E. Hall. 22: 314—1950

6.8 Wood Winds

PATENT

Saxophone. Hector Sommaruga. 22: 666—1950

6.9 Electrical Musical Instruments

PATENTS

Apparatus for producing reentrant magnetic records. John Hays Hammond, Jr. 22: 534—1950
Art or method and means for generating music electrically. Arthur T. Cahill. 22: 315—1950
Automatic volume control for keyboard-operated musical instruments. Ellsworth W. Swedien. 22: 909—1950
Electric musical instrument. Emeric M. Spielman. 22: 409—1950
Electric piano. Frederik Kerkhof. 22: 535—1950
Electrical musical instrument. Laurens Hammond. 22: 534—1950
Electrical musical instrument. Laurens Hammond and John M. Hanert. 22: 535—1950
Electrical musical instrument. John M. Hanert. 22: 409—1950
Electrical musical instrument. John M. Hanert. 22: 534—1950
Electrical musical instrument. Donald L. Hings. 22: 909—1950

Electrical musical instrument. Nicholas Langer. 22: 666—1950
Electrical musical instrument. Merwin J. Larsen. 22: 666—1950
Electrical musical instrument. Spencer W. McKellip. 22: 535—1950
Electrical musical instrument. Stanley Leonard Miller. 22: 534—1950
Electrical musical instrument. James A. Oswald. 22: 908—1950
Electrical piano. Octavio Jose Alvarez. 22: 908—1950
Electrical transmission system for musical instruments. John M. Hanert. 22: 667—1950
Electroacoustical musical instrument. Charles C. Brown. 22: 908—1950
Electronic keyboard instrument. Theodore K. Riggen. 22: 909—1950
Electronic keying means. Thomas J. George. 22: 666—1950
Electronic means providing tremolo for electrically operated musical instruments. Paul H. Rowe. 22: 666—1950
Electronic musical instrument. George H. Marmont. 22: 535—1950
Electronic musical instrument. Albert R. Rienstra. 22: 908—1950
Key mounting. Earnest F. Swanson. 22: 315—1950
Keyboard for musical instruments. Galan W. Demuth. 22: 409—1950
Microphone pick-up and volume control. Harry De Armond. 22: 908—1950
Musical instrument. Jacob T. Kunz. 22: 316—1950
Musical instrument. William Muth and John Muth, Jr. 22: 534—1950
Musical instrument. Andrew Love Notara. 22: 536—1950
Musical instrument. Ernest Robert Workman. 22: 534—1950
Musical vibration translating unit. Burton Minshall. 22: 315—1950
Organ cabinet. Victor I. Zuck. 22: 535—1950
Photoelectric keyboard instrument. Emeric M. Spielman. 22: 666—1950
Rectangular translucent sound track record. Antonio Fuschi. 22: 666—1950
Rotatable loudspeaker support with stationary baffle. Jerome Markowitz. 22: 536—1950
Rotatable tremulant sound producer. Donald J. Leslie. 22: 909—1950
Striker mechanism for musical instruments. Jacob T. Kunz. 22: 315—1950
Tone frequency oscillator. Earle L. Kent. 22: 534—1950
Vibrato organization. Merwin J. Larsen. 22: 409—1950
Voice reproducing instrument. Ned Bullian. 22: 909—1950

6.10 Reed Organs. Accordions, Harmonicas

PATENTS

Accordion. John Kummer. 22: 668—1950
Accordion keyboard silencer. Robert C. Entwistle and Arthur Chariott. 22: 667—1950
Accordion switch key assembly. Leroy R. Stahl. 22: 409—1950
Chromatic harmonicon. André Borel. 22: 76—1950
Harmonica and wind cell block therefor. Finn H. Magnus. 22: 316—1950
Musical instruments. Dominick Zaccagnino. 22: 409—1950
Piano accordion. William B. Ahern and Albert J. Walt. 22: 536—1950
Plastic chromatic harmonica. Finn H. Magnus. 22: 76—1950
Resonant chamber for accordions. Alfredo Frontalini. 22: 667—1950
Support and guard for accordions. William S. Borek. 22: 76—1950
Transposing harmonica. Merrill F. Abbott. 22: 667—1950
Treble action for accordions. William B. Ahern and Albert J. Walt. 22: 667—1950
Valve flap for mouth organs. Hans Bibus. 22: 909—1950

7. Noise

7.1 General, Unclassified

ABSTRACT

Intense noise as an Air Force medical problem. Horace O. Parrack. 22: 682—1950

7.6 Noise in Buildings (see also 2.2)

ABSTRACT

Speech interference levels as criteria for rating background noise in offices. L. L. Beranek and R. B. Newman. 22: 671—1950

7.7 Machinery Noise. Mufflers. Noise Silencers

PAPER

Levels and spectra of transportation vehicle noise. G. L. Bonvallet. 22: 201—1950

ABSTRACTS

New techniques in the analysis of motor and machine noise. R. O. Fehr and G. E. Henry. 22: 671—1950
Quieting of transit-type diesel-powered coaches. David C. Apps. 22: 672—1950
Spectra and loudness of modern automobile horns. D. B. Callaway. 22: 672—1950

PATENTS

Acoustic wave filter with resistive termination, including side branch chamber. Warren P. Mason. 22: 316—1950
Baffle-type muffler. Matthew F. Lathers. 22: 316—1950
Baffle-type muffler with corrugated casing. Berton G. Harley. 22: 668—1950
Manifold silencer with circular flow. John P. Tyskewicz. 22: 76—1950
Muffler with cutout and removable baffle. John A. Christman. 22: 668—1950
Muffler with internal side branch chamber. John R. Fluor, Foster M. Stephens, Arnold Bartels, and Charles Newman. 22: 669—1950
Pulsation and flow control system for gas lines. Blair G. Aldridge. 22: 668—1950
Silencer with cloth gas-conducting conduit. Ralph L. Leadbetter. 22: 668—1950
Silencer with elongated pipe connecting plural chambers. Foster M. Stephens. 22: 669—1950
Silencer with flat semicylindrical expansion chamber. Pierre E. Bessière. 22: 668—1950
Sound absorption. Clifford Mannal. 22: 668—1950

8. Standards

8.1 General, Unclassified

PAPERS

American standard method for the coupler calibration of earphones Z24.9—1949 (abridged). L. L. Beranek, F. F. Romanow, K. C. Morrical, L. J. Anderson, B. B. Bauer, R. D. Cook, and W. Wathen-Dunn. 22: 602—1950
American standard method for the pressure calibration of laboratory standard microphones Z24.4—1949 (abridged). L. L. Beranek, R. K. Cook, F. F. Romanow, F. M. Wiener, and B. B. Bauer. 22: 611—1950
American standard specification for laboratory standard pressure microphones Z24.8—1949 (abridged). L. L. Beranek, F. M. Wiener, F. Massa, B. B. Bauer, F. F. Romanow, and R. K. Cook. 22: 609—1950

9. Speech and Singing

9.1 General, Unclassified

PAPERS

Apparent source of speech in the mouth. Mones E. Hawley and A. H. Kettler. **22**: 365—1950

Autocorrelation analysis of speech sounds. K. N. Stevens. **22**: 769—1950

Communication patterns in task-oriented groups. Alex Bavelas. **22**: 725—1950

Description of language design. Martin Joos. **22**: 701—1950

Effect of room characteristics upon vocal intensity and rate. John W. Black. **22**: 174—1950

Effects of delayed speech feedback. Bernard S. Lee. **22**: 824—1950

Information theory point of view in speech communication. R. M. Fano. **22**: 691—1950

Intelligibility of amplitude-dichotomized, time-quantized speech waves. J. C. R. Licklider. **22**: 820—1950

Introduction: a definition of communication. S. S. Stevens. **22**: 689—1950

Language engineering. George A. Miller. **22**: 720—1950

Masking of pure tones and of speech by white noise. J. E. Hawkins, Jr. and S. S. Stevens. **22**: 6—1950

Method of calculating hearing loss for speech from an audiogram. Harvey Fletcher. **22**: 1—1950

Pathology in speech communication. Ira J. Hirsh. **22**: 717—1950

Perception of speech and its relation to telephony. Harvey Fletcher and Rogers H. Galt. **22**: 89—1950

Portrayal of some elementary statistics of speech sounds. S. H. Chang. **22**: 768—1950

Relation of phonetics and linguistics to communication theory. Oliver H. Straus. **22**: 709—1950

Speech and language. John Lotz. **22**: 712—1950

Speech, language, and learning. Norbert Wiener. **22**: 696—1950

System-function analysis of speech sounds. W. H. Huggins. **22**: 765—1950

Toward the specification of speech. R. K. Potter and J. C. Steinberg. **22**: 807—1950

Typology of languages. Paul Menzerath. **22**: 698—1950

Uniform speech-peak clipping in a uniform signal-to-noise spectrum ratio. Daniel W. Martin. **22**: 614—1950

ABSTRACTS

Apparent source of speech in the mouth. Mones E. Hawley and A. H. Kettler. **22**: 82—1950

Autocorrelation analysis of speech sounds. K. N. Stevens. **22**: 677—1950

Calculation of vowel resonances. H. K. Dunn. **22**: 82—1950

Information theory point of view in speech communication. Robert M. Fano. **22**: 677—1950

Intelligibility of amplitude- and time-quantized speech waves. J. C. R. Licklider. **22**: 677—1950

Measurement, portrayal, and interpretation of some statistical properties of speech sounds. Sze-hou Chang, George E. Pihl, and Martin W. Essigmann. **22**: 677—1950

Preliminary studies of speech produced by a pattern playback. Franklin S. Cooper, Alvin M. Liberman, and John M. Borst. **22**: 678—1950

Singing voice research with the sound spectrograph. Paul Oncley. **22**: 687—1950

Speech interference levels as criteria for rating background noise in offices. L. L. Beranek and R. B. Newman. **22**: 671—1950

Toward the specification of speech. R. K. Potter and J. C. Steinberg. **22**: 677—1950

Use of the pattern playback in studies of vowel color by synthesis. Pierre Delattre. **22**: 678—1950

SUBTITLES

Errata: The perception of speech and its relation to telephony. **22**: 327—1950

Speech communication conference. **22**: 393—1950

9.3 Articulation Testing. Intelligibility. Defective Speech

PAPERS

Intelligibility of interrupted speech. George A. Miller and J. C. R. Licklider. **22**: 167—1950

Perception of speech and its relation to telephony. Harvey Fletcher and Rogers H. Galt. **22**: 89—1950

Relation between localization and intelligibility. Ira J. Hirsh. **22**: 196—1950

ABSTRACT

General statistical theory for the masking effect of reverberation on the intelligibility. A. MacDonald and R. H. Bolt. **22**: 83—1950

SUBTITLES

Effects of noise upon articulation. Harvey Fletcher and Rogers H. Galt. **22**: 119—1950

Errata: The perception of speech and its relation to telephony. Harvey Fletcher and Rogers H. Galt. **22**: 327—1950

Speech interrupted by noise. George A. Miller and J. C. R. Licklider. **22**: 171—1950

9.5 Frequency Analyses of Speech Sounds

PAPERS

Autocorrelation analysis of speech sounds. K. N. Stevens. **22**: 769—1950

Calculation of vowel resonances, and an electrical vocal tract. H. K. Dunn. **22**: 740—1950

Spectrum analysis. Franklin S. Cooper. **22**: 761—1950

System-function analysis of speech sounds. W. H. Huggins. **22**: 765—1950

ABSTRACT

Calculation of vowel resonances. H. K. Dunn. **22**: 82—1950

9.6 Instruments Relating to Speech and Singing

PAPERS

Apparatus for speech compression and expansion and for replaying visible speech records. F. Vilbig. **22**: 754—1950

Calculation of vowel resonances, and an electrical vocal tract. H. K. Dunn. **22**: 740—1950

Sonograph and sound mechanics. Jean Dreyfus-Graf. **22**: 731—1950

Speaking machine of Wolfgang von Kempelen. Homer Dudley and T. H. Tarnoczy. **22**: 151—1950

Spectrum analysis. Franklin S. Cooper. **22**: 761—1950

ABSTRACTS

Preliminary studies of speech produced by a pattern playback. Franklin S. Cooper, Alvin M. Liberman, and John M. Borst. **22**: 678—1950

Speech analyzer and synthesizer. W. A. Munson and H. C. Montgomery. **22**: 678—1950

Use of the pattern playback in studies of vowel color by synthesis. Pierre Delattre. **22**: 678—1950

PATENTS

Device for artificially generating speech sounds by electrical means. Roelof Vermeulen and Willem Six. **22**: 316—1950

Speech analysis and synthesis system. Homer W. Dudley. **22**: 410—1950

9.8 Speech Power. Singing Voice Power

PAPERS

Effect of room characteristics upon vocal intensity and rate. John W. Black. **22**: 174—1950

Experimental study of vowel intensities. Grant Fairbanks, Arthur S. House, and Eugene L. Stevens. **22**: 457—1950

Method of calculating hearing loss for speech from an audiogram. Harvey Fletcher. 22: 1—1950

9.9 Vibrato

ABSTRACT

Preferred rate and extent of the frequency vibrato. John F. Corso and Don Lewis. 22: 83—1950

9.10 Phonetics

PAPERS

Relation of phonetics and linguistics to communication theory. Oliver H. Straus. 22: 709—1950

Reversed speech and repetition systems as means of phonetic research. W. Meyer-Eppler. 22: 804—1950

10. Ultrasonics (Supersonics)

10.1 General, Unclassified

PAPERS

Measurements of the ultrasonic cries of bats. Donald R. Griffin. 22: 247—1950

Relative output from magnetostriction ultrasonic generators. F. M. Leslie. 22: 418—1950

ABSTRACTS

Matrices of piezoelectric, elastic, and dielectric constants. Karl S. Van Dyke. 22: 681—1950

Ultrasonography. Paul J. Ernst. 22: 686—1950

10.3 Ultrasonic Instruments

PAPERS

Crystal pick-up for measuring ultrasonic wave velocity and dispersion in solid rods. A. E. Bakanowski and R. B. Lindsay. 22: 14—1950

Derivation and tabulation of the piezoelectric equations of state. J. F. Haskins and J. S. Hickman. 22: 584—1950

New ultrasonic interferometer for liquids. Joseph L. Hunter. 22: 243—1950

Piezoelectric equations of state and their application to thickness-vibration transducers. Walter G. Cady. 22: 579—1950

Relative output from magnetostriction ultrasonic generators. F. M. Leslie. 22: 418—1950

Resonant acoustic interferometry with air-liquid reflecting surface. Joseph L. Hunter and Francis E. Fox. 22: 238—1950

Ultrasonic measurement techniques applicable to small solid specimens. H. J. McSkimin. 22: 413—1950

Ultrasonic underwater "point source" probe. Louis Fein. 22: 876—1950

ABSTRACTS

Cylindrical barium titanate transducers. T. F. Johnston and F. D. Wertz. 22: 676—1950

Small crystal probe transducer for ultrasonic studies. Herbert W. Cooper. 22: 86—1950

Surface vibration patterns of piezoelectric radiators. J. D. Nixon and A. O. Williams, Jr. 22: 676—1950

Ultrasonic interferometry for highly dissipative media. James L. Stewart and Ellen S. Stewart. 22: 683—1950

Ultrasonic measurement technique for small specimens. H. J. McSkimin. 22: 86—1950

Use of barium titanate transducers for producing large amplitudes of motion and high forces at ultrasonic frequencies. W. P. Mason and R. F. Wick. 22: 676—1950

Variable resonant frequency crystal systems. W. J. Fry, R. B. Fry, and W. Hall. 22: 676—1950

SUBTITLES

Measurement of coefficients of velocity *versus* temperature. H. J. McSkimin. 22: 417—1950

Measurement of phase shift at reflecting interface. H. J. McSkimin. 22: 415—1950

PATENTS

Apparatus for driving flexible members. Robert A. Fryklund. 22: 669—1950

Electromechanical transducer. Charles Revell Holden. 22: 669—1950

Generation of transverse vibrations in liquids. Warren P. Mason. 22: 537—1950

Magnetostrictive device. Roman Smoluchowski. 22: 410—1950

Means for inspecting materials by wave trains. Ralph B. DeLano, Jr. 22: 910—1950

Method of and apparatus for cleaning by ultrasonic waves. Hal F. Fruth. 22: 536—1950

Resonance inspection method. Floyd A. Firestone. 22: 536—1950

Supersonic door control. Edward N. Howell and Ellis Wellington D'Arcy. 22: 910—1950

Supersonic inspection for flaws lying near the surface of a part. Floyd A. Firestone. 22: 536—1950

Transducer for ultrasonic waves. Howard H. Claassen. 22: 910—1950

Ultra high frequency vibrator. Hugo Benioff. 22: 76—1950

Vibrating apparatus. Richard S. Robinson. 22: 410—1950

10.4 Gases, Ultrasonic Velocities, Dispersion, and Absorption (see also 11.3)

PAPERS

Effects of humidity on ultrasonic absorption in air at 1.46 megacycles. G. S. Verma. 22: 861—1950

Propagation of sound in rarefied helium. Martin Greenspan. 22: 568—1950

Scattering of ultrasonic waves in gases. M. Mokhtar and M. Shehata. 22: 16—1950

ABSTRACTS

Dispersion in the ultrasonic absorption and reflection coefficients in hydrogen and deuterium. Ellen S. Stewart and James L. Stewart. 22: 683—1950

Propagation of sound in rarefied helium. Martin Greenspan. 22: 684—1950

Ultrasonic absorption in air. H. C. Rothenberg and W. H. Pielemeier. 22: 81—1950

SUBTITLE

Diffraction of sound through a slit. M. Mokhtar and M. Shehata. 22: 17—1950

10.5 Liquids, Ultrasonic Velocities, Dispersion, and Absorption (see also 13.2 and 13.3)

PAPERS

New ultrasonic interferometer for liquids. Joseph L. Hunter. 22: 243—1950

Sound scattering from a fluid sphere. Victor C. Anderson. 22: 426—1950

Ultrasonic absorption in liquids. George W. Hazzard. 22: 29—1950

ABSTRACTS

Absorption measurements in electrolytic solutions. M. C. Smith, R. Barrett, and R. T. Beyer. 22: 684—1950

Mechanisms of sound absorption in fluids. Jordan J. Markham. 22: 684—1950

Ultrasonic absorption in liquids. C. J. Moen. 22: 684—1950

SUBTITLES

Dispersion of ultrasonic velocity in liquid higher fatty acids. Y. Wada, S. Shimbo, and M. Oda. 22: 880—1950(L.E.)

Sound absorption in three petroleum oils. Joseph L. Hunter and Francis E. Fox. 22: 240—1950

Ultrasonic absorption *vs.* viscosity for solutions of polystyrene in benzene. George W. Hazzard. 22: 31—1950

Ultrasonic absorption *vs.* viscosity for solutions of polystyrene in toluene. George W. Hazzard. **22**: 31—1950

10.6 Solids, Ultrasonic Velocities, Dispersion, and Absorption

PAPERS

Acoustical properties of anisotropic materials. W. J. Price and H. B. Huntington. **22**: 32—1950

Experiments on acoustic absorption in sand and soil. W. L. Nyborg, I. Rudnick, and H. K. Schilling. **22**: 422—1950

On ultrasonic scattering by polycrystals. H. B. Huntington. **22**: 362—1950

Ultrasonic measurement techniques applicable to small solid specimens. H. J. McSkimin. **22**: 413—1950

Velocity of compressional waves in rods of rectangular cross section. R. W. Morse. **22**: 219—1950

Velocity of sound through tissues and the acoustic impedance of tissues. George D. Ludwig. **22**: 862—1950

ABSTRACTS

New methods for measuring ultrasonic velocity in solids. G. W. Willard. **22**: 684—1950

Ultrasonic study of rubber at low temperatures. A. W. Nolle. **22**: 86—1950

SUBTITLES

Dispersion in aluminum rods. A. E. Bakanowski and R. B. Lindsay. **22**: 15—1950

Measurement of coefficients of velocity *versus* temperature. H. J. McSkimin. **22**: 417—1950

Ultrasonic velocity dispersion in solid rods. T. F. Hueter. **22**: 514—1950(L.E.)

Velocity of sound in germanium crystals. H. J. McSkimin. **22**: 415—1950

PATENT

Compressional wave delay means. David L. Arenberg. **22**: 910—1950

10.7 Physical Effects of Ultrasonic Waves

ABSTRACT

Effect of ultrasonic waves on the hydrogen electrode. Ernest Yeager, John Bugosh, Harry Dietrick, and Frank Hovorka. **22**: 686—1950

PATENT

Method of extracting oils from fish material. Ralph F. Shropshire. **22**: 316—1950

10.8 Chemical Effects of Ultrasonic Waves

SUBTITLE

Ultrasonic measurement of solvation. Y. Wada, S. Shimbo, and M. Oda. **22**: 880—1950(L.E.)

10.9 Biological Effects of Ultrasonic Waves

PAPERS

Measurements of the ultrasonic cries of bats. Donald R. Griffin. **22**: 247—1950

Physical factors involved in ultrasonically induced changes in living systems: I. Identification of non-temperature effects. W. J. Fry, V. J. Wulff, D. Tucker, and F. J. Fry. **22**: 867—1950

ABSTRACTS

Behavior patterns of the laboratory mouse under auditory stress. Mable Frings and Hubert Frings. **22**: 682—1950

Experimental study of temperatures produced by ultrasonic radiations in bone marrow, bone, and adjacent tissues. E. J. Baldes, Paul A. Nelson, and J. F. Herrick. **22**: 682—1950

Observations on the effects of standing sound waves on living cells. David E. Goldman. **22**: 682—1950

On the detection of brain tumors by ultrasonics. T. F. Hueter, R. H. Bolt, and H. T. Ballantine, Jr. **22**: 686—1950

Ultrasonic irradiation of nerve tissue. W. J. Fry and V. J. Wulff. **22**: 682—1950

***11. Waves and Vibrations* (*see also 13*)**

11.1 General, Unclassified

PAPERS

Acoustic filter for water-filled pipes. Robert M. Hoover, Donald T. Laird, and Laymon N. Miller. **22**: 38—1950

Measurements of the ultrasonic cries of bats. Donald R. Griffin. **22**: 247—1950

ABSTRACT

Correlation of non-linear resistance, flow resistance, and differential resistance for sharp-edged circular orifices. Peter J. Westervelt and Peter W. Sieck. **22**: 680—1950

11.2 Diffraction. Interference. Scattering. Reflection. Echoes. Standing Waves

PAPERS

On the diffraction of a plane sound wave by a paraboloid of revolution. C. W. Horton and F. C. Karal, Jr. **22**: 855—1950

On the non-specular reflection of plane waves of sound. Victor Twersky. **22**: 539—1950

Phase distortion of acoustic pulses obliquely reflected from a medium of higher sound velocity. A. B. Arons and D. R. Yennie. **22**: 231—1950

Sound scattering from a fluid sphere. Victor C. Anderson. **22**: 426—1950

Variational principles in acoustic diffraction theory. Harold Levine. **22**: 48—1950

ABSTRACTS

Reflection of acoustic waves from a medium of variable velocity. Gerald S. Heller. **22**: 685—1950

Scattering of sound by cylinders and spheres. James J. Faran, Jr. **22**: 677—1950

SUBTITLE

Erratum: The diffraction of sound by rigid disks and rigid square plates. Francis M. Wiener. **22**: 47—1950

11.2.1 Gross Movement of Matter by Sound or Vibration. Chladni Figures. Kundt's Striae. Sensitive Flames (see also 5.14 and 10.7)

PAPER

Mean pressure and velocity in a plane acoustic wave in a gas. Peter J. Westervelt. **22**: 319—1950

ABSTRACTS

Sonic wind and static pressure in intense sound fields. J. P. Walker and C. H. Allen. **22**: 680—1950

Steady force exerted on a small sphere in a plane progressive wave containing a second harmonic component. Peter Westervelt and Peter Sieck. **22**: 680—1950

11.3 Propagation of Sound. Absorption during Propagation. Velocity of Sound. Refraction. Wave-Length. Doppler Effect (see also 10.4, 10.5, 10.6, 13.2, and 13.3)

PAPERS

Acoustical properties of anisotropic materials. W. J. Price and H. B. Huntington. **22**: 32—1950

Classical viscosity in tubes and cavities of large dimensions. B. P. Bogert. **22**: 432—1950

Dependence of shadow zone sound on the surface sound velocity gradient. Robert W. Morse. **22**: 857—1950

Experiments on acoustic absorption in sand and soil. W. L. Nyborg, I. Rudnick, and H. K. Schilling. **22**: 422—1950

Propagation of sound in rarefied helium. Martin Greenspan. **22**: 568—1950

Velocity of compressional waves in rods of rectangular cross section. R. W. Morse. **22**: 219—1950

Velocity of sound through tissues and the acoustic impedance of tissues. George D. Ludwig. **22**: 862—1950

ABSTRACTS
Automatic sound-field mapper. Jordan J. Baruch. 22: 686—1950
Experimental determination of acoustic wave fronts. Paul Tamarkin, George L. Boyer, and Robert T. Beyer. 22: 686—1950
Investigation of wave propagation in thin rubber rods. William S. Cramer. 22: 685—1950
Matrices of piezoelectric, elastic, and dielectric constants. Karl S. Van Dyke. 22: 681—1950
Measurement of bulk modulus and associated loss factor for rubber and plastics. Charles S. Sandler. 22: 685—1950
New methods for measuring ultrasonic velocity in solids. G. W. Willard. 22: 684—1950
Transmission of sound in a liquid between concentric cylinders. Daniel R. Curran. 22: 685—1950

11.4 Radiation from Vibrating Objects. Acoustical Impedance. Mechanical Impedance (see also 5.3 and 13.7)

PAPERS
Method for measuring source impedance and tube attenuation. J. E. White. 22: 565—1950
Sound field of a Straubel X-cut crystal. E. W. Samuel and R. S. Shankland. 22: 589—1950

ABSTRACTS
Correlation of non-linear resistance, flow resistance, and differential resistance for sharp-edged circular orifices. Peter J. Westervelt and Peter W. Sieck. 22: 680—1950
Impedance of an oscillating sphere in a viscous-elastic compressible medium. Hans L. Oestreicher. 22: 682—1950
Maximum directivity index and efficiency of linear arrays. Robert L. Pritchard. 22: 676—1950
Measurement of the mechanical impedance of resilient materials. Albert London and Anthony W. Orlacchio. 22: 686—1950
New expansion for the velocity potential of a piston source. A. H. Carter and A. O. Williams, Jr. 22: 676—1950

11.5 Sounds of Finite Amplitude. Distortion

PAPERS
Acoustic circulation effects and the non-linear impedance of orifices. U. Ingård and S. Labate. 22: 211—1950
Mean pressure and velocity in a plane acoustic wave in a gas. Peter J. Westervelt. 22: 319—1950

ABSTRACTS
Acoustic generation of circulation currents and jet effects. U. Ingård and S. Labate. 22: 87—1950
Finite amplitude distortion in a spherically diverging sound wave in air. Clayton H. Allen. 22: 680—1950
Generation of harmonics by small circular orifices. P. J. Westervelt. 22: 86—1950
Steady force exerted on a small sphere in a plane progressive wave containing a second harmonic component. Peter Westervelt and Peter Sieck. 22: 680—1950

11.6 Sound in Tubes

PAPERS
Acoustic circulation effects and the non-linear impedance of orifices. U. Ingård and S. Labate. 22: 211—1950
Acoustic filter for water-filled pipes. Robert M. Hoover, Donald T. Laird, and Laymon N. Miller. 22: 38—1950
Attenuation in a rectangular slotted tube of (1,0) transverse acoustic waves. H. E. Hartig and R. F. Lambert. 22: 42—1950
Boundary layer attenuation of higher order modes in rectangular and circular tubes. Ralph E. Beatty, Jr. 22: 850—1950
Classical viscosity in tubes and cavities of large dimensions. B. P. Bogert. 22: 432—1950
Method for measuring source impedance and tube attenuation. J. E. White. 22: 565—1950
On the change of cross section and bifurcation of a cylindrical tube. John W. Miles. 22: 59—1950
On the propagation of sound waves in a cylindrical conduit. Fred B. Daniels. 22: 563—1950

ABSTRACTS
Attenuation of (n,0) transverse modes in a rectangular tube. Ralph E. Beatty, Jr. 22: 685—1950
Transmission of sound in a liquid between concentric cylinders. Daniel R. Curran. 22: 685—1950

SUBTITLES
Attenuation of (n,0) transverse modes in a rectangular tube. Ralph E. Beatty, Jr. 22: 639—1950(L.E.)
Attenuation of (1,0) "transverse" acoustic waves in a rectangular tube. E. A. G. Shaw. 22: 512—1950(L.E.)
Erratum: On the propagation of sound in narrow conduits. Osman K. Mawardi. 22: 640—1950

PATENT
Compression wave transmission. Herbert J. McSkimin. 22: 910—1950

11.6.1 Sources of Sound (see also 7.8 and 11.4)

ABSTRACT
Stage I edge tones. M. D. Burkhard, W. L. Nyborg, and H. K. Schilling. 22: 681—1950

11.7 Theory of Waves and Vibrating Systems (see also 5.4)

PAPERS
Acoustic circulation effects and the non-linear impedance of orifices. U. Ingård and S. Labate. 22: 211—1950
Acoustical properties of anisotropic materials. W. J. Price and H. B. Huntington. 22: 32—1950
Correlation function analysis. L. G. Kraft. 22: 762—1950
Equivalent circuit for a vibrating beam which includes shear motions. H. M. Trent. 22: 355—1950
Influence of the relative radial thickness of a ring on its natural frequencies. F. Buckens. 22: 437—1950
Mean pressure and velocity in a plane acoustic wave in a gas. Peter J. Westervelt. 22: 319—1950
Phase distortion of acoustic pulses obliquely reflected from a medium of higher sound velocity. A. B. Arons and D. R. Yennie. 22: 231—1950
Short-time autocorrelation functions and power spectra. R. M. Fano. 22: 546—1950
Torsional vibrations of coupled cylinders. Myra F. Kilpatrick and John E. Kilpatrick. 22: 224—1950
Velocity of compressional waves in rods of rectangular cross section. R. W. Morse. 22: 219—1950

ABSTRACTS
Correlation functions and their application to communication problems. Y. W. Lee and J. B. Wiesner. 22: 677—1950
Equivalent circuit for a vibrating beam which includes shear motions. H. M. Trent. 22: 81—1950
Force equations of motion. R. E. Roberson. 22: 81—1950
On the turbulence limit for sound through apertures. Uno Ingård. 22: 680—1950
Stage I modes of a rectangular whistle. W. L. Nyborg and C. L. Woodbridge. 22: 86—1950
Steady force exerted on a small sphere in a plane progressive wave containing a second harmonic component. Peter Westervelt and Peter Sieck. 22: 680—1950

Symmetry in the equations for electromechanical coupling. F. V. Hunt. **22**: 672—1950
Wave equation studies of Stamni (sonic true airspeed and Mach number indicator). Victor B. Corey. **22**: 681—1950

SUBTITLES

Application of vector analysis to the wave equation. W. J. Cunningham. **22**: 61—1950(L.E.)
Note on "The. application of vector analysis to the wave equation." R. V. L. Hartley. **22**: 511—1950 (L.E.)
Velocity considerations in pulse propagation. T. D. Northwood and D. V. Anderson. **22**: 513—1950(L.E.)

11.8 Biological Effects of Vibration and Sound (see also 10.9)

PAPER

Measurements of the ultrasonic cries of bats. Donald R. Griffin. **22**: 247—1950

ABSTRACTS

Destruction of the pinnae of white mice by high intensity air-borne sound. Hubert Frings and Irma Senkovits. **22**: 682—1950
Effects of high intensity sound upon *micrococcus pyogenes*, var. *aureus*. Helen Kinsloe, B. R. Choman, J. J. Reid, R. J. Nertney, and W. L. Nyborg. **22**: 683—1950
Production of variations in plants and animals by acoustic vibrations. Raymond H. Wallace. **22**: 683—1950
Resonances of biological cells at sonic frequencies. Eugene Ackerman. **22**: 682—1950
Techniques for exposing biological suspensions to air-generated sound. W. L. Nyborg, R. J. Nertney, and J. W. Spencer. **22**: 683—1950

PATENT

Method of accelerating the growth of microorganisms. Ralph F. Shropshire. **22**: 537—1950

12. (Changed to Section 0)

13. Underwater Sound

13.1 General, Unclassified

PAPER

Acoustic filter for water-filled pipes. Robert M. Hoover, Donald T. Laird, and Laymon N. Miller. **22**: 38—1950

SUBTITLE

On the absorption of high power sound waves. Yoshihito Takesada. **22**: 515—1950(L.E.)

13.2 Propagation of Sound in Water. Attenuation. Fluctuation

PAPERS

Acoustical impedance of a bubbly mixture and its size distribution function. Norman Davids and E. G. Thurston. **22**: 20—1950
Transmission of 24-kc underwater sound from a deep source. Myles J. Sheehy. **22**: 24—1950

ABSTRACT

Recent methods for the measurement of sound transmission in the ocean. R. J. Urick. **22**: 87—1950

SUBTITLE

Fluctuation of 24-kc underwater sound. Myles J. Sheehy. **22**: 27—1950

13.3 Velocity of Sound in Water. Refraction. Doppler Effect

ABSTRACT

Velocity of sound in sea water. Alfred Weissler and Vincent A. Del Grosso. **22**: 684—1950

13.4 Reflection. Echoes. Structures for Absorbing Sound in Water

PAPERS

Acoustic filter for water-filled pipes. Robert M. Hoover, Donald T. Laird, Laymon N. Miller. **22**: 38—1950
Phase distortion of acoustic pulses obliquely reflected from a medium of higher sound velocity. A. B. Arons and D. R. Yennie. **22**: 231—1950

ABSTRACT

Measurement of the acoustic properties of sound absorbent panels at high hydrostatic pressures. W. J. Trott and C. L. Darner. **22**: 681—1950

13.6 Scattering. Reverberation in Water

PAPERS

Acoustical impedance of a bubbly mixture and its size distribution function. Norman Davids and E. G. Thurston. **22**: 20—1950
Sound scattering from a fluid sphere. Victor C. Anderson. **22**: 426—1950

13.7 Radiation from Objects Vibrating under Water. Acoustical Impedance. Mechanical Impedance

PAPER

Acoustical impedance of a bubbly mixture and its size distribution function. Norman Davids and E. G. Thurston. **22**: 20—1950

PATENT

Electroacoustic translator, including impedance matching. Frank Powell Best. **22**: 410—1950

13.11 Instruments Relating to Underwater Sound. General

PATENTS

Apparatus for simulating naval vessels and their maneuvers. William G. Gorton, Frank Pulsifer, and Arnold M. Skudre. **22**: 537—1950
Reflector. Paul Rosenberg and Raymond L. Garman. **22**: 410—1950

13.11n Navigational Instruments Using Underwater Sound. Underwater Listening and Echo Ranging Devices. Sonar

PATENTS

Acoustical sound locating device. Harvey C. Hayes. **22**: 76—1950
Amplifier for underwater listening apparatus. Frank P. Herrnfeld. **22**: 537—1950
Depth sounder. George R. Paine and John P. McGuire. **22**: 411—1950
Depth sounding recorder. William R. Ryan and Sol Levine. **22**: 911—1950
Distance measuring device. Albert E. Anderson. **22**: 77—1950
Distance measuring device. Peter M. Modlowski and Arnold M. Skudre. **22**: 669—1950
Echo ranging and listening gear. Horace M. Trent and Thomas F. Jones. **22**: 77—1950
Echo ranging apparatus. Henry T. Winchel. **22**: 537—1950
Frequency variation system for echo ranging. William W. Wiseman and Russell B. Wright. **22**: 538—1950
Hydrofoil depth control. William Maurice Ewing and John L. Worzel. **22**: 411—1950
Navigation aiding apparatus. Frank Powell Best, Christopher Dering Colchester, and James Twatt. **22**: 317—1950
Navigational apparatus. John H. Bollman, Fred A. Brooks, and John G. Kreer, Jr. **22**: 538—1950
Optical sound bearing system. Robert M. Sherwood, Robert J. Urick, and Leo P. Delsasso. **22**: 316—1950
Range indicator for multirange recorders. Albert E. Anderson. **22**: 537—1950

Reflecting device. Paul Rosenberg. 22: 77—1950
Sending and receiving signaling system. Brownlee B. Gauld. 22: 410—1950
Sound ranging. Edward W. Smith. 22: 911—1950
Sound ranging distance measuring system. Robert A. Fryklund and John N. Beebe. 22: 911—1950
Sound ranging training apparatus. Carlton M. Beyer and Ernest M. Bolze. 22: 77—1950
Submarine signaling apparatus. Hugo Benioff. 22: 77—1950
Submarine sound direction determining system. Laurence Batchelder. 22: 78—1950
Submersible reflecting body. John T. Beechlyn. 22: 78—1950
System for echo ranging. Edwin E. Turner, Jr. 22: 317—1950
System of wave trains. Donald Orr Sproule. 22: 77—1950
Underwater sonic apparatus. George C. Evans. 22: 911—1950

13.11t Transducers for Underwater Sound. Transducer Calibration

PAPERS
Derivation and tabulation of the piezoelectric equations of state. J. F. Haskins and J. S. Hickman. 22: 584—1950
Piezoelectric equations of state and their application to thickness-vibration transducers. Walter G. Cady. 22: 579—1950

ABSTRACT
Cylindrical barium titanate transducers. T. F. Johnston and F. D. Wertz. 22: 676—1950

SUBTITLE
Magnetostriction vibrator for Al-Fe alloy. Yoshihito Takesada. 22: 290—1950(L.E.)

PATENTS
Acoustical apparatus. Harvey C. Hayes and Elias Klein. 22: 317—1950
Compressional wave translating device. Arthur C. Keller. 22: 78—1950
Device for transmitting and receiving compressional waves. Hugo Benioff. 22: 317—1950
Electrical impedance matching apparatus. Bertram M. Harrison. 22: 78—1950
Electroacoustic transducer. Loy E. Barton. 22: 318—1950
Electromechanical transducer. Arthur C. Keller. 22: 412—1950
Enclosure for vibratile elements. Frank J. Alois and Richard W. Samsel. 22: 411—1950
Hydrophone. Eugen Merten. 22: 538—1950
Magnetostriction hydrophone. John R. Kauke. 22: 411—1950
Magnetostrictive oscillator. Albert L. Thuras. 22: 317—1950
Magnetostrictive transducer. Harry F. Olson and John Preston. 22: 79—1950
Magnetostrictive transducer. Robert L. Peek, Jr. 22: 79—1950
Magnetostrictive transmitter. Edward E. Mott. 22: 911—1950
Means for the interchange of electrical and acoustical energy. Edwin E. Turner, Jr. 22: 318—1950
Mounting for magnetostrictive driving units. Hubert N. Hall and J. Guy Woodward. 22: 79—1950
Piezoelectric apparatus. Hans Jaffe. 22: 670—1950
Piezoelectric crystal unit. Frank Massa. 22: 670—1950
Piezoelectric transducer. Harry B. Shaper. 22: 538—1950
Pressure responsive transducer. Clifford Frondel. 22: 412—1950
Submarine signal device covered with waterproof vibration damping shield. Clifford W. Mell, Edwin C. Ballentine, and James V. O'Neill. 22: 670—1950
Submarine signaling device. Rollin W. Gillespie. 22: 411—1950
Testing tank arranged for suppression of reflected compressional waves. Warren P. Mason. 22: 911—1950
Ultrasonic underwater "point source" probe. Louis Fein. 22: 876—1950
Underwater sound detecting and indicating system. O. Hugo Schuck. 22: 318—1950
Underwater sound generator. John M. Ide. 22: 670—1950
Underwater sound transmitter or receiver. Frank Massa. 22: 78—1950
Underwater transducer. Donald E. Ross. 22: 318—1950

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